In the Claims

1. (Amended) A proximity detection circuit for detecting the presence of a moving hand, said circuit comprising:

an antenna with which is associated a fixed time constant determined by a fixed internal capacitance and a fixed resistance, as well as a variable time constant that is longer than the fixed time constant by an amount determined by an external capacitive load, said variable time constant being on the order of twice said fixed time constant when the external capacitive load is a hand of a person in proximity to the antenna;

an oscillator circuit adapted to provide a periodic charge to the antenna ;with a periodicity greater than said fixed time constant;

~~an~~ a first operational amplifier being operated as a unity gain follower and receiving ~~an antenna signal~~ from the antenna a periodic antenna signal having an exponential waveform (0096) that has a longer time constant and a lower amplitude when said external capacitive load is in proximity to said antenna, the waveform of the antenna signal being thus representative of changes in ~~an~~ the external capacitive load on the antenna;

a detector circuit including a peak averaging capacitor ~~receiving the~~ responsive to the periodic exponential waveform of the antenna signal via the first operational amplifier and ~~being~~ adapted to output a detection signal representative of ~~in response to~~ a low frequency ~~changes in~~ component of the antenna signal;

a low-pass filter coupled to an input of a second operational amplifier operated as a gain and offset amplifier for amplifying said low frequency signal component and rejecting a higher frequency noise component;

an auto-compensate capacitor responsive to the amplified and filtered low frequency signal component output by the second operational amplifier for providing a compensated detection signal with increased sensitivity to transient signals representative of a waving hand in proximity to the antenna; and

a comparator receiving the compensated detection signal and being adapted to generate an output signal in response thereto.

2. (Original) The proximity detection circuit of claim 1 further comprising at least one static protection circuit having at least one first diode conducting away from ground and at least one second diode conducting toward a supply voltage.

3. (Original) The proximity detection circuit of claim 1, wherein the detector circuit comprises a voltage peak detector.

4. (Cancelled) ~~The proximity detection circuit of claim 1 further comprising a low-pass filter electrically coupled between the detector circuit and the comparator.~~

5. (Cancelled) ~~The proximity detection circuit of claim 1 further comprising an amplifier electrically coupled between the detector circuit and the comparator.~~

6. (Original) The proximity detection circuit of claim 1, wherein the comparator is adapted to generate the output signal when the detection signal has a predetermined voltage level as compared to a reference voltage.

7. (Original) The proximity detection circuit of claim 6 further comprising a switch electrically coupled to the comparator, the switch being adapted to adjust the reference voltage.

8. (Amended) A proximity detection circuit for detecting the presence of a moving hand, said circuit comprising:

an antenna with which is associated a fixed time constant determined by a predetermined capacitance and a predetermined resistance, as well as a variable time constant that is longer than the fixed time constant by an amount determined by an external capacitive load, said variable time constant being on the order of twice said fixed time constant when the external capacitive load is a hand of a person in proximity to the antenna;

means for charging the antenna with an oscillating signal with a periodicity greater than said fixed time constant;

an operational amplifier being operated as a unity gain follower and receiving an antenna signal from the antenna, the antenna signal being representative of an external capacitive load on the antenna and having a periodic exponential

waveform that has a longer time constant and a lower amplitude when said external capacitive load is in proximity to said antenna, the waveform of the antenna signal being thus representative of changes in an the external capacitive load on the antenna;

detection means electrically coupled to the operational amplifier for detecting changes in a low frequency component of the antenna signal and for generating a detection signal in response thereto; and

means responsive to the detection signal for generating an output signal ~~in response to~~ when the detection signal is representative of a waving hand in proximity to the antenna.

9. (Original) The proximity detection circuit of claim 8 further comprising at least one static protection circuit having at least one first diode conducting away from ground and at least one second diode conducting toward a supply voltage.

10. (Original) The proximity detection circuit of claim 8 further comprising means for filtering alternating current interference frequencies from the detection signal.

11. (Original) The proximity detection circuit of claim 8 further comprising means for amplifying the detection signal.

12. (Amended) A method of detecting capacitance changes representative of the presence of a moving hand, said method comprising:

charging an antenna with an oscillating signal to thereby produce a periodic antenna signal, the antenna having an associated fixed time constant determined by a predetermined capacitance and a predetermined resistance, as well as a variable time constant that is longer than the fixed time constant by an amount determined by an external capacitive load, said variable time constant being on the order of twice said fixed time constant when the external capacitive load is a hand of a person in proximity to the antenna, said oscillating signal having a periodicity greater than said fixed time constant;

detecting low frequency changes in ~~an~~ the antenna signal ~~with a detector circuit, the antenna signal being~~ representative of changes in ~~an~~ said external capacitive load on the antenna;

~~buffering an impedance mismatch between the antenna and the detector circuit with an operational amplifier operated as a unity gain follower;~~

generating a low frequency detection signal component ~~from the detector circuit~~ in response to said low frequency changes in the antenna signal;

selectively amplifying said low frequency detection signal component and rejecting a higher frequency noise component to thereby produce an amplified and filtered detection signal component;

compensating for slow environmental changes in the amplified and filtered detection signal component to thereby provide a compensated detection signal with increased sensitivity to transient signals representative of a waving hand in proximity to the antenna; and

generating an output signal in response to the compensated detection signal.

13. (Original) The method of claim 12, wherein generating the output signal includes comparing the detection signal to a reference voltage.

14. (Original) The method of claim 12, wherein charging the antenna with the oscillating signal includes charging the antenna with an oscillating asymmetric signal.

15. (Original) The method of claim 12, wherein detecting changes in the antenna signal includes detecting a peak voltage.

16. (Original) The method of claim 12 further comprising preventing oscillation by including a current limiting resistor at an output terminal of the operational amplifier.

17. (Original) The method of claim 12 further comprising filtering out alternating current interference frequencies from the detection signal.

18. (Cancelled) ~~The method of claim 12 further comprising amplifying the detection signal.~~

19. (Original) The method of claim 12 further comprising filtering out changes in DC voltage levels from the detection signal while passing transient portions thereof.

20. (Amended) A method of detecting capacitance changes representative of the presence of a moving hand, said method comprising:

charging an antenna with an oscillating signal to thereby produce a periodic antenna signal, the antenna having an associated fixed time constant determined by a predetermined capacitance and a predetermined resistance, as well as a variable time constant that is longer than the fixed time constant by an amount determined by an external capacitive load, said variable time constant being on the order of twice said fixed time constant when the external capacitive load is a hand of a person in proximity to the antenna,;

providing the periodic antenna signal with protection from static utilizing at least one static protection circuit comprising at least one first diode adapted to conduct away from ground and at least one second diode adapted to conduct toward a supply voltage;

~~buffering~~ using an operational amplifier operated as a unity gain follower to buffer an impedance mismatch between the antenna and a detector circuit ~~with an operational amplifier operated as a unity gain follower~~;

~~detecting~~ using the detector circuit to detect low frequency changes in ~~an~~ the amplitude of the periodic antenna signal with the detector circuit, the low frequency changes in the antenna signal being representative of ~~an external~~ corresponding changes in a capacitive load on the antenna caused by a moving hand in proximity to the antenna;

generating a detection signal from the detector circuit in response to said low frequency changes in the antenna signal;

compensating for slow environmental changes in the amplified and filtered detection signal component to thereby provide a compensated detection signal with increased sensitivity to transient signals representative of a waving hand in proximity to the antenna; and

generating an output signal in response to detection of changes in the compensated detection signal.

21. (Original) The method of claim 20 wherein generating the output signal includes comparing the detection signal to a reference voltage.

22. (Original) The method of claim 20, wherein charging the antenna with the oscillating signal includes charging the antenna with an oscillating asymmetric signal.

23. (Original) The method of claim 20, wherein detecting changes in the antenna signal includes detecting a peak voltage.

24. (Original) The method of claim 20 further comprising preventing oscillation by including a current limiting resistor at an output terminal of the operational amplifier.

25. (Original) The method of claim 20 further comprising filtering out alternating current interference frequencies from the detection signal.

26. (Original) The method of claim 20 further comprising amplifying the detection signal.

27. (Amended) The method of claim 20 wherein the compensating step further ~~comprising~~ comprises filtering out changes in DC voltage levels from the detection signal while passing transient portions thereof.

28. (Canceled)

29. (Previously Presented) The proximity detection circuit of claim 1, wherein the detector circuit is adapted to output the detection signal in response to changes in peaks of the antenna signal over time.

30. (Amended) The proximity detection circuit of claim 1, wherein the antenna forms one ~~conducing~~conductive side of a capacitor.

31. (Previously Presented) The proximity detection circuit of claim 1, wherein the antenna comprises a single wire antenna.

32. (Cancelled) ~~The proximity detection circuit of claim 1, wherein the antenna signal is an exponential waveform signal.~~

33. (Previously Presented) The proximity detection circuit of claim ~~32~~ 1, wherein ~~the oscillator is adapted to provide charge to the antenna in the form of an oscillating signal and~~ the exponential waveform signal is representative of the integral of the oscillating signal.

34. (Previously Presented) The proximity detection circuit of claim 1, wherein the antenna is coupled in series with one or more resistors, and the operational amplifier is in electronic communication with a conductive element disposed between the antenna and the one or more resistors.

35. (Previously Presented) The proximity detection circuit of claim 8, wherein the detection means generates the detection signal in response to detected changes in peaks of the antenna signal over time.

36. (Amended) The proximity detection circuit of claim 8, wherein the antenna forms one ~~conducing~~conductive side of a capacitor.

37. (Previously Presented) The proximity detection circuit of claim 8, wherein the antenna comprises a single wire antenna.

38. (Cancelled) ~~The proximity detection circuit of claim 8, wherein the antenna signal is an exponential waveform signal.~~

39. (Amended) The proximity detection circuit of claim ~~38~~ 8, wherein the exponential waveform signal is representative of the integral of the oscillating signal.

40. (Previously Presented) The proximity detection circuit of claim 8, wherein the antenna is coupled in series with one or more resistors, and the operational amplifier is in electronic communication with a conductive element disposed between the antenna and the one or more resistors.

41. (Previously Presented) The method of claim 12, wherein charging the antenna with the oscillating signal comprises generating an exponential waveform signal.

42. (Previously Presented) The method of claim 41, wherein charging the antenna with the oscillating signal comprises integrating the oscillating signal with the antenna to generate the exponential waveform signal.

43. (Previously Presented) The method of claim 12, wherein generating the detection signal comprises generating the detection signal in response to changes in peaks of the antenna signal over time.

44. (Amended) The method of claim 12, wherein the antenna forms one ~~conducing~~conductive side of a capacitor.

45. (Previously Presented) The method of claim 12, wherein the antenna comprises a single wire antenna.

46. (Previously Presented) The method of claim 12, wherein the antenna is coupled in series with one or more resistors, and detecting changes in the antenna signal comprises placing the detector circuit in electronic communication with a conductive element disposed between the antenna and the one or more resistors.

47. (Previously Presented) The method of claim 20, wherein charging the antenna with the oscillating signal comprises generating an exponential waveform signal.

48. (Previously Presented) The method of claim 47, wherein charging the antenna with the oscillating signal comprises integrating the oscillating signal with the antenna to generate the exponential waveform signal.

49. (Previously Presented) The method of claim 20, wherein generating the detection signal comprises generating the detection signal in response to changes in peaks of the antenna signal over time.

50. (Amended) The method of claim 20, wherein the antenna forms one ~~conducing~~conductive side of a capacitor.

51. (Previously Presented) The method of claim 20, wherein the antenna comprises a single wire antenna.

52. (Previously Presented) The method of claim 20, wherein the antenna is coupled in series with one or more resistors, and detecting changes in the antenna signal comprises placing the detector circuit in electronic communication with a conductive element disposed between the antenna and the one or more resistors.